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**Kappel et al.**

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(54) **SYSTEM AND METHOD FOR LOGINS**

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 670 days.

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(30) **Foreign Application Priority Data**

Mar. 31, 2000 (EP) ..... 00106948

(57) **ABSTRACT**

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**G06F 7/04** (2006.01)

**G06F 17/60** (2006.01)

**H04M 15/00** (2006.01)

(52) **U.S. Cl.** ..... **726/4; 726/8; 726/21**

(58) **Field of Classification Search** ..... **713/201,**

**713/202, 183, 184; 709/229; 726/4, 8, 21**

See application file for complete search history.

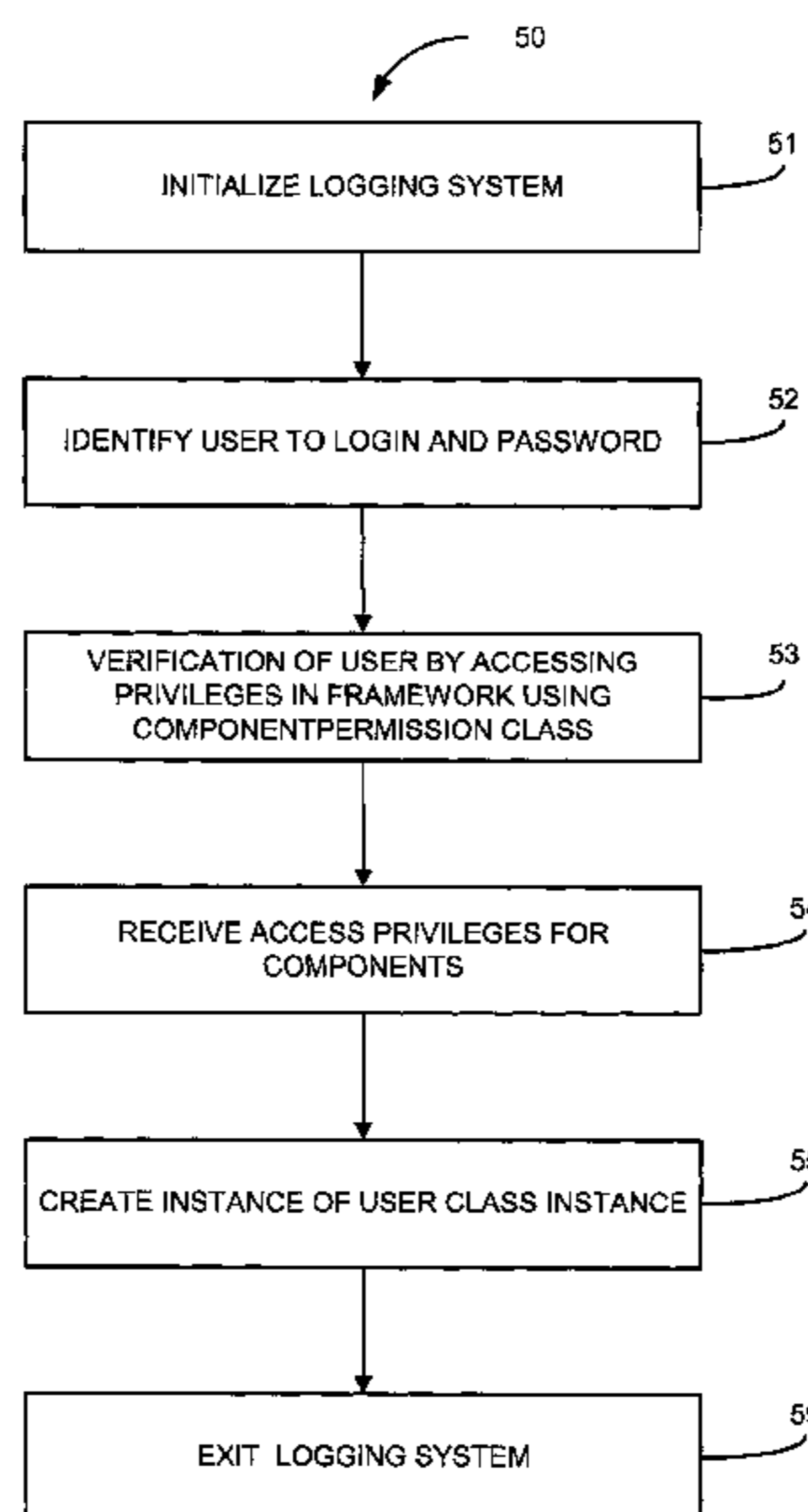
The present invention provides a system and method for securing login to a system. In architecture, the system includes an identifier that identifies a user to login, and a validator that validates the user access privileges. An entry mechanism allows the user to enter the system if the user access privileges are valid. The present invention can also be viewed as a method for securing login to a system. The method operates by identifying a user to login, and validating the user access privileges. The user is allowed to enter the system if the user access privileges are valid.

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**8 Claims, 4 Drawing Sheets**



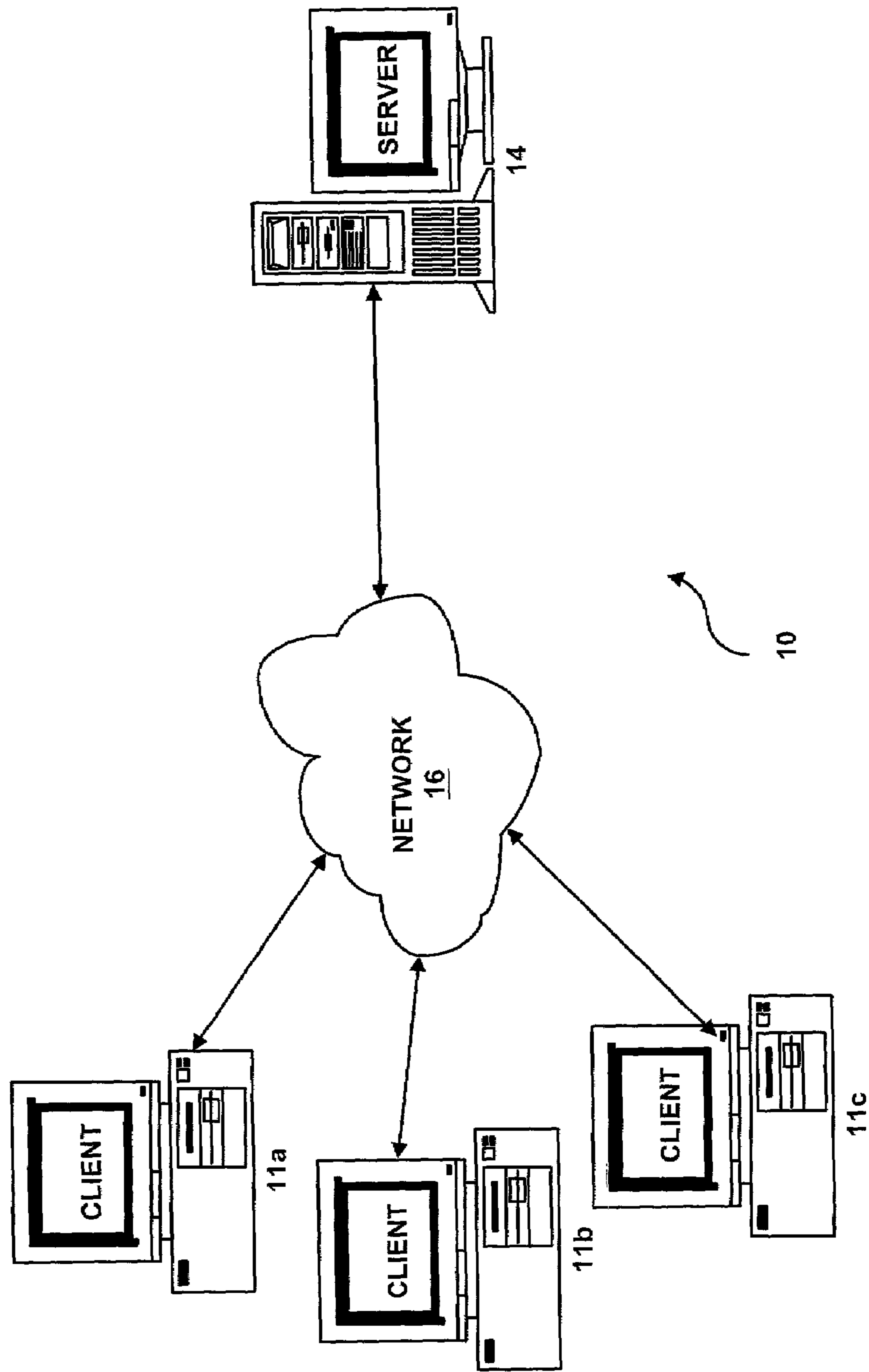


FIG. 1

FIG. 2

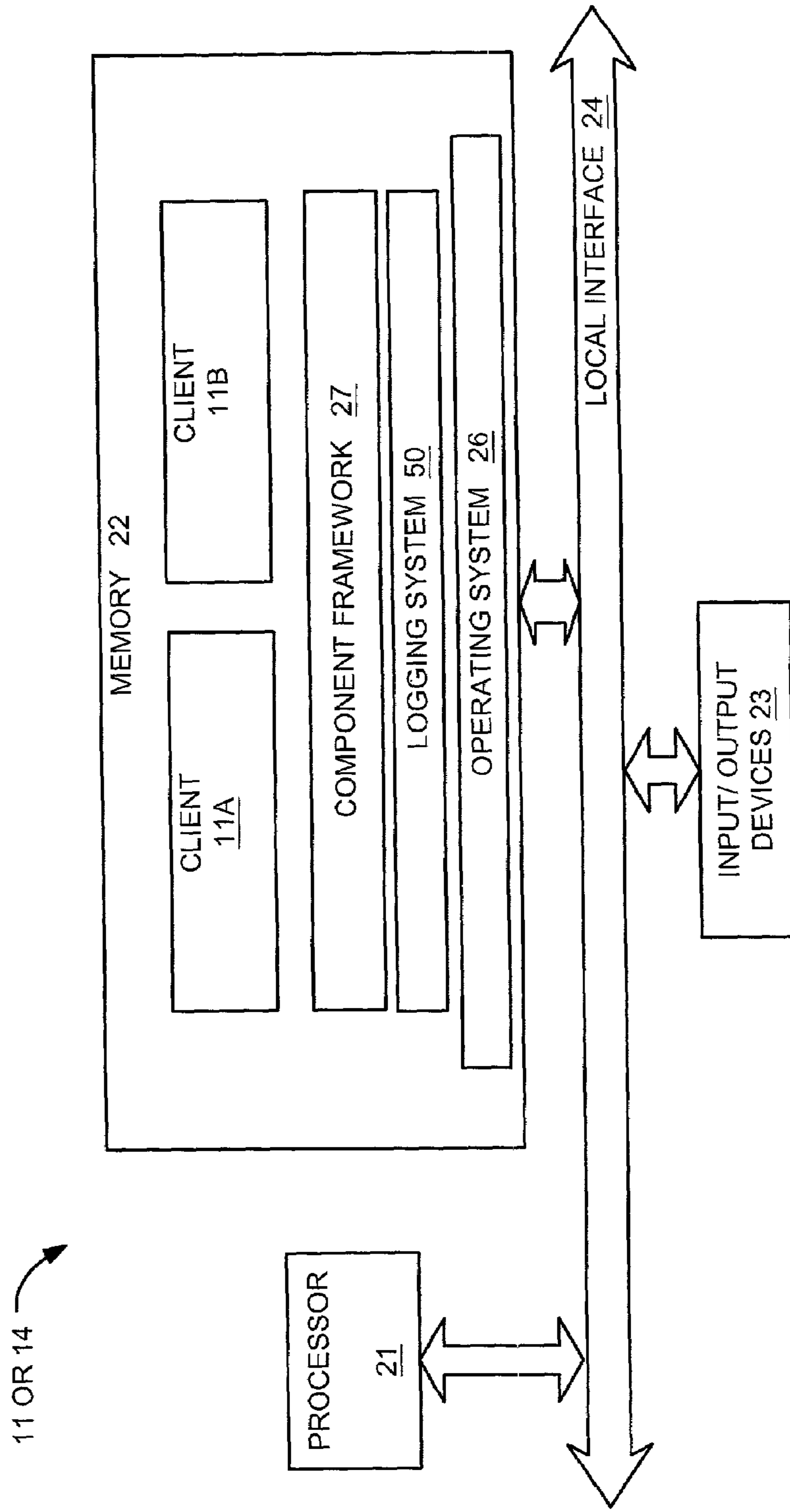
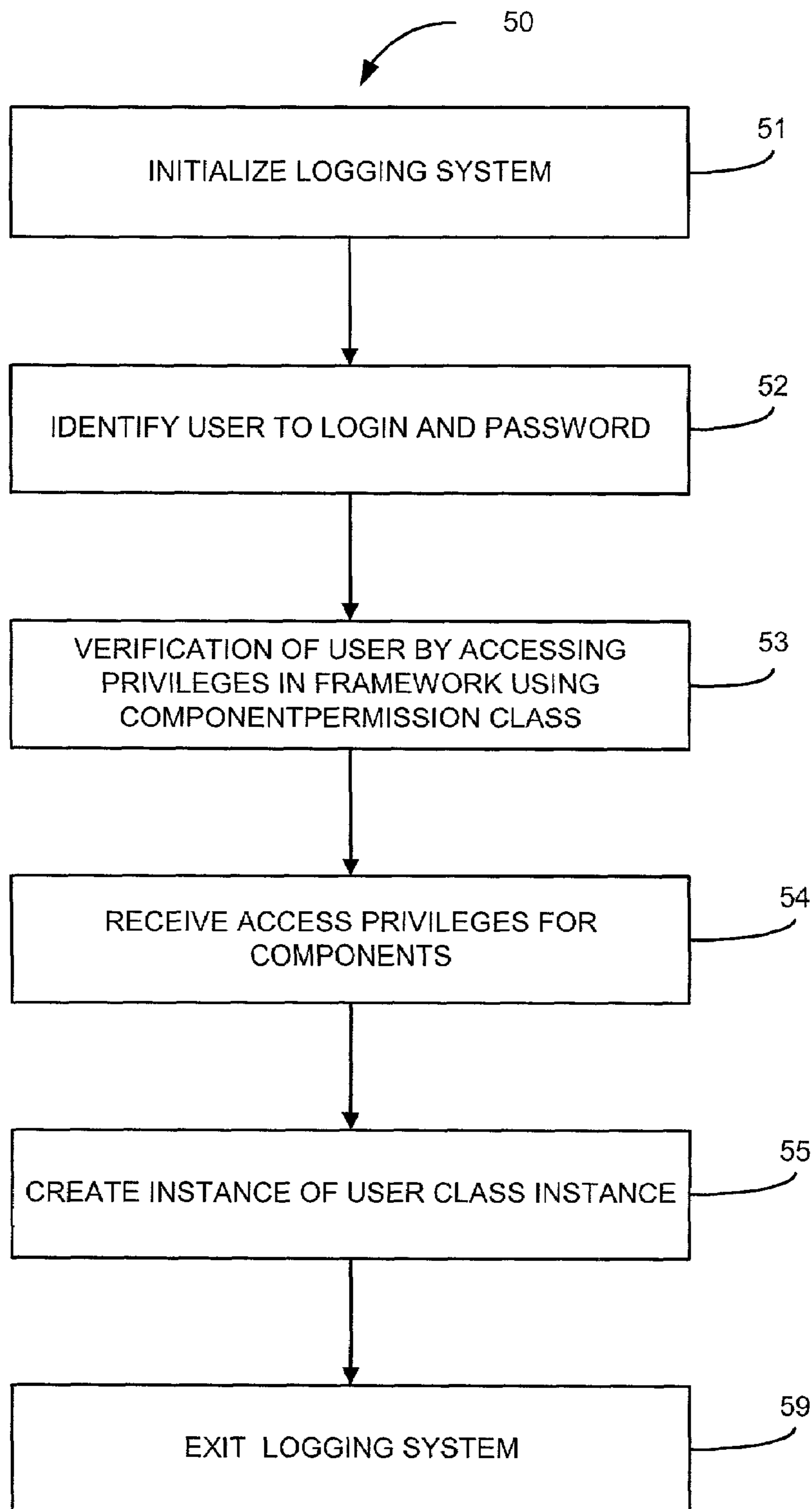


FIG. 3



# FIG. 4

CLASS AND ATTRIBUTES FOR USER <u>70</u>		
USER	←	71
COMPONENTPERMISSION	←	72
CERTIFICATES	←	73

## SYSTEM AND METHOD FOR LOGINS

CLAIM OF PRIORITY AND CROSS  
REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Patent Application entitled "Targys System," filed Mar. 31, 2000 and having Ser. No. 60/193,422, and copending U.S. Utility patent application Ser. No. 09/819,446 entitled, "Customer Care and Billing System," filed on Mar. 28, 2001, which also claims priority to European Patent Application No. 00106948.3-2201, entitled "Customer Care and Billing System," filed Mar. 31, 2000, all of the foregoing of which are now pending and are incorporated herein by reference.

## 1. Field of the Invention

The present invention generally relates to computers and computer software, and more particularly, to a system and method for logging in to a system.

## 2. Description of Related Art

Typically, today's computing and networking environments are complex and geographically distributed, and in the future they will be even more so. However, as the computer and networking environments become more sophisticated, so do the unauthorized users. Generally, today, the biggest threat to any system is from unauthorized access from an inside or outside party. However, in a drive to become more secure, there is the competing virtue that the security for any system must be simple for authorized users to utilize. If a security system is too complex, authorized users will look for ways to simplify the process, which could put any system in a compromising position.

Thus, a heretofore-unaddressed need exists in the industry to address the aforementioned and/or other deficiencies and inadequacies.

## SUMMARY OF THE INVENTION

The present invention provides a system and method for securing login to a system. In architecture, the system includes an identifier that identifies a user to login, and a validator that validates the user access privileges. An entry mechanism allows the user to enter the system if the user access privileges are valid.

The present invention can also be viewed as providing a method for securing login to a system. In this regard, the preferred method can be broadly summarized by the following steps. The method operates by (1) identifying a user to login; (2) validating the user access privileges, and (3) allowing the user to enter the system if the user access privileges are valid.

Other features and advantages of the present invention will become apparent to one with skill in the art upon examination of the following drawings and detailed description. It is intended that all such additional features and advantages be included herein within the scope of the present invention.

## BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings incorporated in and forming a part of the specification illustrate several aspects of the present invention, and together with the description, serve to explain the principles of the invention. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views. In the drawings:

FIG. 1 is a block diagram illustrating an example of a network in which the login system may be implemented.

FIG. 2 is a block diagram illustrating an example of a computer system utilizing an operating system and login system of the present invention.

FIG. 3 is a flow chart illustrating an example of the process flow of the login system of the present invention, as shown in FIG. 2.

FIG. 4 is a block diagram illustrating the user and component classes, the class and attributes for a user, as shown in FIG. 3.

DETAILED DESCRIPTION OF THE  
PREFERRED EMBODIMENT

Reference will now be made in detail to the description of the invention as illustrated in the drawings. While the invention will be described in connection with these drawings, there is no intent to limit it to the embodiment or embodiments disclosed therein. On the contrary, the intent is to cover all alternatives, modifications, and equivalents included within the spirit and scope of the invention as defined by the appended claims.

Referring now to the drawings, wherein like reference numerals designate corresponding parts throughout the drawings, FIG. 1 is a block diagram that portrays a diagram of a network that illustrates the flexibility, expandability, and platform independence in which the Login system of the present invention may be implemented. Referring to FIG. 1, a series of client computers **11a**, **11b**, **11c** are connected to a server computer **14** via a network **16**. The network **16** may be, for example, but is not limited to, a dial-in network, local area network (LAN), wide area network (WAN), public switched telephone network (PSTN), Intranet, Internet, Ethernet type networks, and the like. The client computers **11a**, **11b**, **11c** (hereinafter, **11**) may be located within a LAN, WAN, PSTN, Intranet, Internet, Ethernet type networks, or the like. It should be noted that the number of client computers and server computers may differ from the number presently illustrated. Further, it should also be noted that, that the preferred embodiment of the invention describes the functionality provided by a server computer **14**.

An example of a general-purpose computer that can implement the login system **50** of the present invention is shown in FIG. 2. The Login system **50** of the invention can be implemented in software (e.g., firmware), hardware, or a combination thereof. In one embodiment, the Login system **50** is implemented in software, as an executable program, and is executed by a special or general purpose digital computer, such as a personal computer (PC; IBM-compatible, Apple-compatible, or otherwise), workstation, mini-computer, personal digital assistant (PDA) or mainframe computer.

Generally, in terms of hardware architecture, as shown in FIG. 2, the computers **11** or **31** include a processor **21**, memory **22**, and one or more input and/or output (I/O) devices **23** (or peripherals) that are communicatively coupled via a local interface **24**. The local interface **24** can be, for example but not limited to, one or more buses or other wired or wireless connections, as is known in the art. The local interface **24** may have additional elements, which are omitted for simplicity, such as controllers, buffers (caches), drivers, repeaters, and receivers, to enable communications. Further, the local interface **24** may include address, control, and/or data connections to enable appropriate communications among the aforementioned components.

The processor **21** is a hardware device for executing software that can be stored in memory **22**. The processor **21** can be virtually any custom made or commercially available processor, a central processing unit (CPU) or an auxiliary processor among several processors associated with the computer **11** and/or **14**, and a semiconductor based microprocessor (in the form of a microchip) or a macroprocessor. Examples of suitable commercially available microprocessors are as follows: an 80x86 or Pentium series microprocessor from Intel Corporation, U.S.A., a PowerPC microprocessor from IBM, U.S.A., a Sparc microprocessor from Sun Microsystems, Inc, a PA-RISC series microprocessor from Hewlett-Packard Company, U.S.A., or a 68xxx series microprocessor from Motorola Corporation, U.S.A.

The memory **22** can include any one or combination of volatile memory elements (e.g., random access memory (RAM, such as DRAM, SRAM, etc.)) and nonvolatile memory elements (e.g., ROM, hard drive, tape, CDROM, etc.). Moreover, the memory **22** may incorporate electronic, magnetic, optical, and/or other types of storage media. Note that the memory **22** can have a distributed architecture, where various components are situated remote from one another, but can be accessed by the processor **21**.

The software in memory **22** may include one or more separate programs, each of which comprises an ordered listing of executable instructions for implementing logical functions. In the example of FIG. 2, the software in the memory **22** includes the Login system **50** and a suitable operating system (O/S) **26**.

A non-exhaustive list of examples of suitable commercially available operating systems **26** is as follows: a Windows operating system from Microsoft Corporation, U.S.A., a Netware operating system available from Novell, Inc., U.S.A., an operating system available from IBM, Inc., U.S.A., any LINUX operating system available from many vendors or a UNIX operating system, which is available for purchase from many vendors, such as Hewlett-Packard Company, U.S.A., Sun Microsystems, Inc. and AT&T Corporation, U.S.A. The operating system **26** essentially controls the execution of other computer programs, such as the Login system **50**, and provides scheduling, input-output control, file and data management, memory management, and communication control and related services.

The Login system **50** may be a source program, executable program (object code), script, or any other entity comprising a set of instructions to be performed. When a source program, then the program is usually translated via a compiler, assembler, interpreter, or the like, which may or may not be included within the memory **22**, so as to operate properly in connection with the O/S **26**. Furthermore, the Login system **50** can be written as (a) an object oriented programming language, which has classes of data and methods, or (b) a procedure programming language, which has routines, subroutines, and/or functions, for example but not limited to, C, C++, Pascal, BASIC, FORTRAN, COBOL, Perl, Java, and Ada.

The I/O devices **23** may include input devices, for example but not limited to, a keyboard, mouse, scanner, microphone, etc. Furthermore, the I/O devices **23** may also include output devices, for example but not limited to, a printer, display, etc. Finally, the I/O devices **23** may further include devices that communicate both inputs and outputs, for instance but not limited to, a modulator/demodulator (modem; for accessing another device, system, or network), a radio frequency (RF) or other transceiver, a telephonic interface, a bridge, a router, etc.

If the computer **11** and/or **14**, is a PC, workstation, or the like, the software in the memory **22** may further include a basic input output system (BIOS) (omitted for simplicity). The BIOS is a set of essential software routines that initialize and test hardware at startup, start the O/S **26**, and support the transfer of data among the hardware devices. The BIOS is stored in ROM so that the BIOS can be executed when the computer **11** and/or **14** is activated.

When the computer **11** and/or **14** is in operation, the processor **21** is configured to execute software stored within the memory **22**, to communicate data to and from the memory **22**, and to generally control operations of the computer **11** and/or **14** pursuant to the software. The Login system **50** and the O/S **26** are read, in whole or in part, by the processor **21**, perhaps buffered within the processor **21**, and then executed.

When the Login system **50** is implemented in software, as is shown in FIG. 3, it should be noted that the Login system **50** can be stored on virtually any computer readable medium for use by or in connection with any computer related system or method. In the context of this document, a computer readable medium is an electronic, magnetic, optical, or other physical device or means that can contain or store a computer program for use by or in connection with a computer related system or method. The Login system **50** can be embodied in any computer-readable medium for use by or in connection with an instruction execution system, apparatus, or device, such as a computer-based system, processor-containing system, or other system that can fetch the instructions from the instruction execution system, apparatus, or device and execute the instructions.

In the context of this document, a "computer-readable medium" can be any means that can store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device. The computer readable medium can be, for example but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, device, or propagation medium. More specific examples (a nonexhaustive list) of the computer-readable medium would include the following: an electrical connection (electronic) having one or more wires, a portable computer diskette (magnetic), a random access memory (RAM) (electronic), a read-only memory (ROM) (electronic), an erasable programmable read-only memory (EPROM, EEPROM, or Flash memory) (electronic), an optical fiber (optical), and a portable compact disc read-only memory (CDROM) (optical). Note that the computer-readable medium could even be paper or another suitable medium upon which the program is printed, as the program can be electronically captured, via for instance optical scanning of the paper or other medium, then compiled, interpreted or otherwise processed in a suitable manner if necessary, and then stored in a computer memory.

FIG. 3 is a data flow diagram illustrating an example of the process flow of the login system **50** of the present invention. The login system **50** provides security that is implemented in the component framework **27** (FIG. 2) using a number of security specific classes that allow definition of an access privilege for classes and attributes for users. The enforcement of the security definitions here is currently the responsibility of the clients. The component framework only allows the definition of the access privileges, but does not use them itself. The access privileges in the framework are defined on class and attribute levels, using the class "component permission" which is herein illustrated in FIG. 4.

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Access privileges for components are assigned to instance of the "user" class where the system users are modeled. The "user" class is the fundamental security class in the component framework 27. It contains all the information about a user's name, description, and the default access permissions. Users are those clients that can access a server, and thus, can be end users, Internet users, or other components.

The login system 50 is initialized at step 51. At step 52, the login system identifies a user by login and password. At step 53, the login system 50 performs verification of the user by accessing privileges in the component framework 27 (FIG. 2) using the component permission class. The component permission class is herein illustrated with regard to FIG. 4.

At step 54, the login system receives access privilege for the components. At step 55, the login system 50 then creates an instance of a user/class instance for all the privileges for the user. The login system 90 then exits at step 59.

Illustrated in FIG. 4 is a block diagram illustrating the user and component classes, the class and attributes for a user.

The foregoing description has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Modifications or variations are possible in light of the above teachings.

The embodiment or embodiments discussed were chosen and described to provide the best illustration of the principles of the invention and its practical application to thereby enable one of ordinary skill in the art to utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated. All such modifications and variations are within the scope of the invention as determined by the appended claims when interpreted in accordance with the breadth to which they are fairly and legally entitled.

What is claimed is:

1. A system for securing login to a system, comprising:  
 means for identifying a user to login;  
 means for validating the user access privileges;  
 means for allowing the user to enter the system if the user access privileges are valid;  
 means for accessing user access privileges by using a components permission class that is located in a system framework; and  
 means for receiving true user access privileges when the user is a valid user.

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2. The system of claim 1 wherein said means for identifying further comprises:

means for inputting the user name and password.

3. A method for securing login to a system, said method comprising the steps of:

identifying a user to login;

validating the user access privileges;

allowing the user to enter the system if the user access privileges are valid;

accessing user access privileges by using a components permission class located in a system framework; and receiving true user access privileges when the user is a valid user.

4. The method of claim 3 wherein said identifying step further comprises the step of:

inputting the user name and password.

5. A computer readable medium for securing login to a system, comprising:

logic for identifying a user to login;

logic for validating the user access privileges;

logic for allowing the user to enter the system if the user access privileges are valid;

logic for accessing user access privileges by using a components permission class which is located in a system framework; and

logic for receiving true user access privileges when the user is a valid user.

6. The computer readable medium of claim 5, wherein said logic for identifying further comprises:

logic for inputting the user name and password.

7. A system for securing login to a system, comprising:  
 an identifier that identifies a user to login;  
 a validator that validates the user access privileges; and  
 an entry mechanism that allows the user to enter the system if the user access privileges are valid;

wherein said validator for accessing user access privileges uses a components permission class, which is located in a system framework; and

further wherein said validator for accessing user access privileges receives true user access privileges when the user is a valid user.

8. The system of claim 7, wherein the identifier uses the user name and password to identify the user.

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